National Aeronautics and Space Administration

Health, Medicine and Biotechnology

Ultrasonic Periodontal Structures Mapping Device

for making and recording differential measurements of periodontal structures

Researchers at NASA's Langley Research Center have developed diagnostic mapping system for making and recording differential measurements of periodontal structures of a dental patient. The invention employs first and second ultrasonic sensors controlled by a dental hand-piece to make measurements of the cemento-enamel-junction (CEJ) of each tooth and the depth of the periodontal pocket or cavity of the tooth relative its CEJ. These measurements are visually displayed, recorded (or mapped), and compared with previous and/or subsequent measurements as an indication of the presence or progress of periodontal disease.

BENEFITS

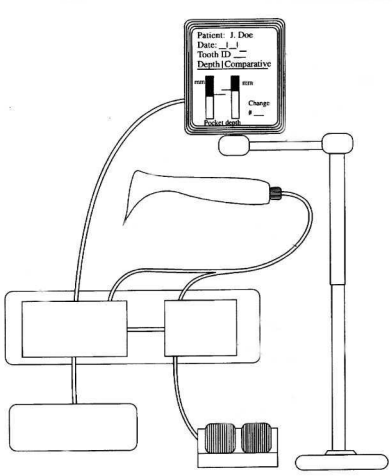
- Visual display of real time data and images
- Automatic archiving and retrieval of patient data for tracing and comparison purposes
- Improved diagnostic information presented in a user friendly manner
- Minimal or no patient discomfort

technology solution

THE TECHNOLOGY

The instrument utilizes ultrasonic sound waves interacting with the tooth structure and with the periodontal structures to map the conditions present within the periodontal pocket. In operation, the software opens a new file on the input of the patient's name. If this is a second or later visit, the software will indicate such and give the dentist the option of opening the previous scan as an underlay for comparison. If this is a new scan, a dental chart will come up on the screen with the typical starting point tooth selected. The dentist can step to whatever point on whatever tooth he wishes on the chart and the data will be entered there. The dentist positions the tip of the hand piece on the desired point of the selected tooth and activates the instrument. The instrument identifies the selected reference point and signals the ultrasound transducer to scan the periodontal space.

The invention is intended as an acoustic anolog of the standard periodontal probe. Instead of a metal probe being inserted into the gingival margin upwards of a hundred times per patient, the acoustic probe will scan the periphery of each tooth noninvasively for the presence of abnormalities in the periodontal pocket. Only if a problem is found will more extensive procedures be necessary.



A drawing of the system

APPLICATIONS

The technology has several potential applications:

- Mapping and recording differential measurements of periodontal structures of a dental patient

PUBLICATIONS

Patent No: 5,755,571

More Information

National Aeronautics and Space Administration

The Technology Gateway

Langley Research Center

Mail Stop 151
Hampton, VA 23681
757.864.1178
LARC-DL-technologygateway@mail.nasa.gov

http://technology.nasa.gov/

www.nasa.gov

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